NOTES ON THE ECOLOGY OF THE SHORT-BILLED MARSH WREN IN THE LOWER ARKANSAS RICE FIELDS

BY BROOKE MEANLEY

THE Short-billed Marsh Wren (*Cistothorus platensis stellaris*) fitted into an unusual ecological picture as a late summer nesting bird in the lower Arkansas rice fields in 1950. Not until the rice began to approach maturity in the middle of August did this species reach the height of its nesting season; in fact it seemed not to be present at all about the rice fields until the rice attained a height of about two feet. Since this occurred about the second week in July, 1950, the Short-billed Marsh Wren appeared in the area on or shortly after this time.

I spent an average of ten hours daily working about the rice fields of Arkansas County, near Stuttgart, from the first of June through the rest of the summer of 1950, and not a single marsh wren was heard singing in a rice field until July 6. After that date, they became increasingly abundant, and by the middle of August about a third of the rice fields in the area had a few pairs, the number of pairs depending largely upon the variety of rice.

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The Lower Arkansas Rice District

The city of Stuttgart is the "capital" of the lower Arkansas rice district. It is located in that part of Arkansas County known as the Grand Prairie. Physiographically, the Grand Prairie is reputedly a true prairie land, and has never been forested except along the streams and bayous. Ecologically, the area can be divided into three major types: rice field (rotated with soybeans, lespedeza, and oats), bayou, and edge. A small percentage of undifferentiated land-use types exists. Among these are scrubby fields, pastures, and towns.

Typical breeding birds of the rice fields are the King Rail (*Rallus elegans*) and the Short-billed Marsh Wren; of the edge, Red-winged Blackbird (*Agelaius phoeniceus*) and Dickcissel (*Spiza americana*); and in bayous, Red-bellied Woodpecker (*Centurus carolinus*), Acadian Flycatcher (*Empidonax*

virescens), Carolina Wren (*Thryothorus ludovicianus*), and Parula Warbler (*Parula americana*). The dominant macro-vegetation of the bayous is the bitter pecan (*Carya aquatica*), willow oak (*Quercus phellos*), and overcup oak (*Quercus lyrata*).

Rice Culture in Arkansas County

About 100,000 acres of rice are planted annually in Arkansas County. This acreage is approximately 25 per cent of the state's output, which, in turn, is 20 per cent of the entire rice crop of the United States. The half dozen varieties of rice commonly grown in the county are Zenith, Blue Rose, Blue Bonnett, Rexark, Nira, and Cody.

Rice is planted from early April to the middle of June. It is generally sown dry, and after the young plants reach a height of about six inches the field is flooded to aid the normal growth of the rice and to keep the various weeds from getting a start in the field. The field remains in this inundated state for about two weeks. It then is drained for a short period, then flooded to a depth of 6 to 12 inches a second time, and not drained again until time for harvesting.

Marsh Wren Nesting Environment

As the rice attains a height suitable for nesting cover about the middle of July, the Short-billed Marsh Wrens move into the rice fields, presumably from nearby grassy canal banks and fallow fields. The fields selected for nesting in 1950 were those most advanced in development, and usually those with the greatest number of weeds. The weedy rice fields provide a dense cover and some of the materials out of which the wren builds its nest. The weeds seldom reach the height of mature stands of rice, which is approximately 40 inches.

Dominant weeds of the rice fields in the Stuttgart area (see Prince, 1927: 1–10) are *Paspalum floridanum, Panicum dichotomiflorum, Echinochloa colonum, Echinochloa crusgalli, Cyperus strigosus, Fimbristylis autumnalis, Sesbania macrocarpa, Aeschynomene virginica.*

Nesting

The A. O. U. Check-List (1931:249) and Bent (1948:274) list the southern nesting limit of the Short-billed Marsh Wren as central Missouri. Thus, these observations extend considerably the known southern nesting limit of this species. Bent lists August 19 as the latest nesting date for this species. Eggs and young found during the first two weeks of September, 1950, in the Arkansas rice fields also extend somewhat the known length of the nesting period.

While it was difficult for me to believe that this species would be nesting so late in the summer, even when I saw male birds singing in rice fields throughout the day in August, a male and a female which I collected on

August 13 provided evidence of nesting. Testes of the male measured 10 mm. in length, while the female had a well-developed brood patch. Furthermore, territorial relationships of singing males were quite evident.

Proof of breeding was obtained when I discovered a nest with six eggs on August 20. The nest, located in a field of "Cody" rice, drained and ready for harvesting, was constructed mainly of the leaves of the rice plant (*Oryza sativa*) and a sedge (*Fimbristylis autumnalis*), and was approximately eight inches from the ground. The nest could not have been built at this low height before the draining of the field just prior to harvesting, since this field was flooded to a depth of 12 inches. I found a second nest containing one fresh egg on August 29, and a nest containing five large young on September 10.

Nesting Density

I censused singing males in seven rice fields totaling 453 acres during the first two weeks in August to see if a correlation existed between nesting density and the development of various varieties of rice. The results showed that the earliest maturing varieties had the highest densities of marsh wrens. A 60-acre field of the "Cody" variety, in the late dough stage in early August, had 12 singing males. A 63-acre field of "Cody" in the same stage of development held 5 singing males. Two fields of the "Blue Bonnet" variety with 35 and 150 acres each, and maturing almost a month later than the "Cody" fields, had one and two singing males respectively.

Effect of Harvesting During Nesting Season

Birds nesting in a rice field which is harvested by a binder have little or no chance of succeeding, since this machine destroys practically all nests it passes over. Probably the only survivors in a field harvested by a binder would be those which nested early so as to have their young already out of the nest by harvest time. Fortunately for the marsh wrens, the combine now almost entirely has replaced the binder as a rice harvesting implement. A combine leaves a stubble 12 to 18 inches high—sufficient cover for any normally placed nest. The victims of this method of harvesting would be only those whose nests were in the path of the wheels, an area which I estimate to be about one-third of the field.

Twelve pairs of nesting marsh wrens were present in one rice field at harvesting time, September 4. On September 10, at least five pairs remained and there may have been others. I found a nest containing five young, a family with three fledged young, and three males singing in territories in this field on September 10.

The nesting season seemed to have ended about the middle of September. By September 15, I could find no singing males and there was no other evidence of nesting.

Summary

1. The lower Arkansas rice district is a true prairie land with an impervious sub-soil, providing ideal conditions for rice-growing, and, in turn, nesting habitat for the Short-billed Marsh Wren.

2. Rice is planted from April to June and is harvested from late August through October. During the greater part of the growing season the fields are inundated.

3. The nesting season of the Short-billed Marsh Wren in Arkansas rice fields coincided in 1950 with the maturing of the rice crop in late August.

4. Fields selected for nesting are usually those with the rice furthest along in development in early August, and those with a greater number of weeds (sedges and grasses).

5. Late summer nesting dates are as follows: August 20 (6 eggs); August 29 (1 egg); and September 10 (5 young).

6. The nesting of this species in the Stuttgart area considerably extends southward the known limit of the breeding range.

7. That some correlation exists between nesting density and development of different varieties of rice is shown by the greater number of singing males in the earlier maturing varieties.

8. The nesting population is somewhat affected by harvesting operations. Machinery destroys some of the nests, causing the wrens to desert the field. Otherwise, the remaining stubble provides adequate cover for the surviving birds to complete nesting, particularly where the rice is combined rather than harvested with a binder.

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